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To cite this article: Debbie Hopkins, James Higham, Sarah Tapp & Tara Duncan (2016) Academic mobility in the Anthropocene era: a comparative study of university policy at three New Zealand institutions, Journal of Sustainable Tourism, 24:3, 376-397, DOI: 10.1080/09669582.2015.1071383

To link to this article: http://dx.doi.org/10.1080/09669582.2015.1071383
Academic mobility in the Anthropocene era: a comparative study of university policy at three New Zealand institutions

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(Received 13 November 2014; accepted 20 May 2015)

Anthropogenic climate change is a wicked problem, requiring fundamental behavioural and technological responses now, in the Anthropocene, a term denoting the current era of human dominance of biological, chemical and geological processes on Earth. Travel and transport policies are key to effective responses, confronting both leisure and business travellers, including academics. This paper explores in detail the factors that promote or suppress academic travel, examining institutional policies which frame academic mobility practices at three New Zealand universities: University of Otago, University of Auckland and Victoria University of Wellington. It finds evidence of little congruence between sustainability statements, with their wide discourses on environmental sustainability, and the institutional policies governing academic mobility. Three overriding themes emerging from the analysis are presented: hollow words (describing a lack of meaningful commitment to sustainability, with disconnections between sustainability rhetoric and key policies), unspoken words (assumptions about the necessity of travel) and facilitating mobilities (promoting travel, rewarding those who travel). These themes highlight varying degrees of divergence between the sustainability imperatives of these universities and the carbon emissions of institutionalised academic mobilities. Concluding remarks highlight opportunities for New Zealand’s academic institutions to align travel policies with growing sustainability imperatives and discuss future research directions.

Keywords: academic mobilities; sustainable transport; internationalisation; climate change; New Zealand; Anthropocene

Introduction

Despite the increasing urgency for action on climate change, emissions of carbon dioxide (CO₂) into the atmosphere are increasing (IPCC, 2013, 2014), creating a wicked problem (Rittel & Webber, 1973). Wicked problems can be defined as “socially complex; unstructured and difficult to clearly define; ever-evolving; cross-cutting; intricately connected to other problems and issues” (Scherrer & Doohan, 2013, p. 1004). While some sectors have had moderate success in abating their emissions, growth in demand for transport and travel is outweighing mitigation efforts (Sims et al., 2014). Technological advancements have generated some efficiency gains; however, transport demand, particularly in aviation, is escalating (Lenzen, Dey, & Hamilton, 2003). The projected growth in aviation is a grave concern (Chapman, 2007), predicted to be as high as 5% per annum for the next decade.
Air passenger numbers are forecast to double from 3.1 billion in 2013, to 6.63 billion in 2032 (Air Transport Action Group, 2014a). With the widespread uptake of long-haul air travel, and the emergence of low-cost carriers, long-distance international mobility has become the norm in many industrialised nations. Consequently, long-haul destinations have transitioned from aspiration to expectation (Shaw & Thomas, 2006).

The term “Anthropocene” has been proposed as a new geological epoch or era (Crutzen & Stoermer, 2000), distinguished from earlier epochs by human dominance of biological, chemical and geological processes on Earth. A proposal to formally acknowledge the term “Anthropocene” is under development, to be considered by the International Commission on Stratigraphy (Subcommission on Quaternary Stratigraphy, 2015). While “Anthropocene” is a less well-known term than “climate change” or “global warming”, it has been argued that it better characterises humans’ wide-ranging impacts on the Earth and presents a “new global ethos” (Crutzen & Schwägerl, 2011). In this paper, its use highlights the necessity to reconsider notions of efficiency, internationalisation and mobility, along with the normative practices used by academic institutions to address the wicked problem of climate change. This paper analyses and assesses those practices.

The capacity to engage in overseas travel has become a vital component of business in an increasingly globalised economy (Beaverstock, Derudder, Faulconbridge, & Witlox, 2009; Storme, Beaverstock, Derudder, Faulconbridge, & Witlox, 2013). Academic careers, for which periods of overseas sabbatical leave have been a long-standing feature (Richardson & Zikic, 2007), have pioneered the business trend towards international obligations and responsibilities (Baruch & Hall, 2004). Increasing demand for long-haul international business travel has been particularly pronounced amongst knowledge organisations (Høyer & Naess, 2001), which are part of the “new globalised, knowledge- and network-based economy” (Castells, 1996, 2010). However, increasing travel has material environmental consequences that are now well-established in the literature (Gössling, Hall, Peeters, & Scott, 2010).

To stabilise carbon dioxide equivalent (CO₂-e) in the atmosphere to 430–530 ppm, and thereby mitigate runaway climate change, drastic reductions are required by key sectors, including transport (Allen et al., 2014). Globally, transport-sector CO₂ emissions represent 23% of all CO₂ emissions from fossil fuel combustion (International Energy Agency, 2013), and 15% of total greenhouse gas (GHG) emissions (International Transport Forum, 2010). In the decade from 2000, annual anthropogenic GHG emissions increased by 10 gigatonnes CO₂-e; this increase arose from the energy (47%), industry (30%), transport (11%) and building (3%) sectors (IPCC, 2014). Aviation contributes to the radiative forcing of the climate through emissions of CO₂, nitrogen oxide (NOₓ), aerosols and their precursors, and increased cloudiness (Lee et al., 2009). This amounts to 2% of all anthropogenic CO₂ emissions (Air Transport Action Group, 2014b), 5% of total anthropogenic forcing (Lee et al., 2009) and 10.6% of all transport direct GHG emissions (Sims et al., 2014). Approximately 80% of these emissions arise from flights over 1500 kilometres (Air Transport Action Group, 2014b), travel for which there is often perceived to be no competitive alternative transport mode available (Air Transport Action Group, 2014b). Under a “business-as-usual” scenario, which includes efficiency improvements, global transport CO₂ emissions are forecast to continue to grow by approximately 40% up to 2030 (International Transport Forum, 2010). Transport growth is currently outweighing mitigation efforts, and both behavioural (e.g. travel substitution and modal choice) and technological (e.g. electric vehicles, hybrid vehicles, low-carbon fuels) change must form part of a suite of mitigation efforts (Bows, Anderson, & Mander, 2009; Sims et al., 2014). The former requires a commitment to understanding and responding to
the underlying socio-economic conditions that support unsustainable current and projected “business-as-usual” mobility patterns.

There is a growing interest amongst academic institutions towards environmental awareness, sustainability and measurement of carbon footprints (Alshuwaikhat & Abubakar, 2008), and there have been calls for academic institutions to demonstrate a commitment to corporate social responsibility (Snell, 2009). However, to date, little attention has been paid to the impacts of work-related travel (Høyer & Naess, 2001), focusing instead on “technical fixes” such as workplace energy production and consumption including lighting and heating (e.g. Bernheim, 2003; Komarek, Lupi, Kaplowitz, & Thorp, 2013). This focus could be attributed to perceptions of academic travel as an essential part of university operations (Smythe, 2010), or the “green campus” movement excluding work activities and practices beyond the campus environment (Alshuwaikhat & Abubakar, 2008). There is an established body of literature about academic mobility as it relates to conference travel (Becken, 2002; Høyer, 2009; Høyer & Naess, 2001; Nevins, 2013; Orsi, 2012). Yet research has shown that a wide range of activities contribute to an academic’s carbon footprint (Achten, Almeida, & Muys, 2013) and therefore closer attention on academics’ travel more broadly, including institutional demands and occupational expectations for mobility, is required. Travel is interwoven with a range of academic activities including research fieldwork, periods of sabbatical leave, conferences, invited keynote presentations, developing research collaborations and collaborative research centres, and adjunct appointments. International academic mobility often begins during the undergraduate career with study abroad programmes, exchanges, fieldwork and internships (Shaw & Thomas, 2006) all contributing to hyper-mobile lifestyles. While overseas travel has historically been part of an academic career (Richardson & Zikic, 2007), it is increasingly important, in the Anthropocene, to explore the drivers of academic travel. A range of factors can promote academic travel, including imperatives to develop international collaborations, funding and dissemination opportunities. Other factors could suppress travel, such as family commitments, travel cost and environmental concerns. This paper contributes to this emerging literature through an examination of the role of university policy in promoting academic travel, with a specific focus on the New Zealand context. Due to its physical remoteness, academic institutions in New Zealand have historically prioritised academic mobility to remain internationally competitive (e.g. in academic recruitment) and connected (e.g. internationalisation), but now must confront issues of sustainability arising from current academic mobility practices. New Zealand provides a unique context within which to examine the sustainability—academic mobilities conundrum.

Institutional sustainabilities

The sustainability of university campuses has rapidly become an issue of global concern (Alshuwaikhat & Abubakar, 2008; Barnes & Jerman, 2002; Bekessy, Samson, & Clarkson, 2007; Bernheim, 2003; Komarek et al., 2013). This arises from an acknowledgement of the detrimental impact university activities can have on the environment, as well as their increasing size, with many universities similar to small cities (Alshuwaikhat & Abubakar, 2008). There have been a range of collective and individual responses; for example, the Talloires Declaration (1990, Association of University Leaders for a Sustainable Future, 2001) was signed by over 300 university administrators from over 40 countries. The declaration stated: “Universities have a major role in the education, research, policy formation, and information exchange necessary to make these
goals possible. Thus, university leaders must initiate and support mobilization of internal and external resources so that their institutions respond to this urgent challenge” (Association of University Leaders for a Sustainable Future, 1990, p. 1). Although the abatement of GHG emissions was specifically highlighted, transport and travel were not identified as a particular source of these emissions.

The role of academic travel in campus sustainability is implicit in most definitions of a “sustainable university”:

A higher educational institution, as a whole or as a part, that addresses, involves and promotes, on a regional or a global level, the minimization of negative environmental, economic, societal, and health effects generated in the use of their resources in order to fulfil its functions of teaching, research, outreach and partnership, and stewardship in ways to help society make the transition to sustainable lifestyles. (Velazquez, Munguia, Platt, & Taddei, 2006, p. 812)

It is common for higher education institutions to address emissions in relation to source of emissions via a threefold classification. Scope 1 emissions directly occur from sources that are owned or controlled by the institution, including emissions from combustion in owned or controlled boilers, furnaces and vehicles. Scope 2 accounts for emissions from the generation of purchased electricity consumed by the organisation. Scope 3 emissions relate to all other indirect emissions which are a consequence of the activities of the institution, but occur from sources not owned or controlled by the university; these include waste, commuting and business travel. Scope 3 emissions are often considered to be the most difficult to calculate and define (Higher Education Funding Council for England [HEFCE], 2010a), and are therefore often excluded from climate auditing processes.

A 2009 report of English higher education institutions reported that transport (Scope 3) emissions arising from student and employee travel accounted for 37% of total institutional emissions in 2006 (HEFCE, 2009), yet targets for carbon reduction related only to Scope 1 and Scope 2 emissions. Sector-wide targets were set, with the higher education sector in England agreeing to “commit to meet the government targets for carbon emission reductions in Scopes 1 and 2 of 34 per cent by 2020 and 80 per cent by 2050 against a 1990 baseline” (HEFCE, 2010b, p. 12). However, despite being linked to capital funding, carbon emissions are rising at most English institutions, with elite institutions performing worst (Williams, 2011). The Scope 3 emissions accountability of New Zealand universities is likely to significantly exceed 37% due to the geographical position of New Zealand, and proximity between domestic urban centres.

Despite efforts to institutionalise “global citizenship” within academic frameworks (Lewin, 2009), engagement with global-scale issues is often lacking. Issues of “research impacts” and ethical considerations are often closely tied to localised concerns rather than global issues. Mitigation of researcher impacts has become a matter of public interest, although tertiary institutions have been reluctant to accept accountability for researcher travel emissions (e.g. through carbon offsetting) due to reasons of cost. Yet while conversations on sustainability and higher education have not fully engaged with travel- and transport-related emissions, the critical need for academic communities to rethink mobility demands has not gone unnoticed. The Chronicle of Higher Education provocatively proposed that “Academic Travel Causes Global Warming” (Pedelty, 2008) and highlighted the carbon intensiveness of academic conference attendance. There is an innate paradox in emitting GHGs in order to travel to attend conferences or research meetings on sustainability and
environmental topics (Grémillet, 2008), and this highlights the necessity of understanding the drivers of academic travel more fully.

**Academic travel in the Anthropocene**

The imperative to reduce anthropogenic carbon emissions in order to limit manifestations of climate change calls for substantial behavioural changes in industrialised countries (Victor et al., 2014). For transport, while technological efficiency gains may provide some opportunities (Sims et al., 2014), rising demand will dwarf these gains. Therefore it is necessary to understand how and why people travel, and to consider the fundamental motives for travel. 

A wide range of interrelated factors can be used to understand the travel behaviours of academic communities, including the structural pressures or norms that exist in academic institutions, individual motivations and career aspirations, identity enhancement, social status (Gössling & Nilsson, 2010), the ability to gain cultural capital from long-haul mobility and to escape from daily responsibilities (Nevins, 2013).

Fox et al. (2009) identified a series of “well-justified” reasons to fly including to network with a large group of colleagues, eliminating the need for multiple trips to see individual colleagues, to build or develop a relationship and to conduct field research that cannot be done any other way. They also highlight a series of “poorly justified” reasons for travel such as the need to stay “in the loop”, or to ensure that your ideas will be given as much weight as competing ideas brought in person by others, and to symbolise that your topic is important. Nevertheless, justification of air travel in any circumstances fails to engender the critical reflection that is required by all academics, institutions and funding bodies, for all types of travel, if the necessary emission reductions are to be achieved. Moreover, the Anthropocene demands new ways of framing transport mode choice, and the necessity of travel. The research presented in this paper specifically focuses on the role of institutional policy in promoting or otherwise influencing the purpose, regularity and extent of academic travel.

**Institutional factors supporting academic travel**

Modern scientific research is characterised by frequent air travel (Fox et al., 2009). Travel decision-making by academic staff members occurs in the context of, amongst other things, institutional expectations and family commitments (Bailyn, 2003). Travel decision-making is highly individualised; research suggests that degrees of internationalisation depend on gender, source country, subject and career stage (Jöns, 2011). While academics are often perceived to have greater individual control over transport and travel decisions than other careers, these choices are also heavily impacted by institutional conditions which determine what travel is prioritised, deemed necessary, or desirable, and the mode of transportation chosen (Høyer & Naess, 2001).

Transport modal choice, for example, can be influenced by the cultural norms of the institution. Many universities hold an internal culture prioritising air travel (Høyer & Naess, 2001), and modal choice is closely connected to perceptions of importance: “flying may act as a signal to colleagues that you are a busy and important person. If you choose to go by train, some might interpret this as a sign that your time schedule is not very tight and that you might be able to carry a heavier workload” (Høyer & Naess, 2001, p. 464). In the context of New Zealand, air travel is often perceived to be the only transport mode available for most domestic and all international travel. Where land-based transport (e.g.
private car, bus) is available, the time commitment required for these modes results in widely held perceptions of them as being “inefficient” use of time; perceptions that are challenged by new conceptualisations of efficiency in the Anthropocene.

While networking, conference attendance and international collaborations have been identified as drivers of academic mobility, these factors are also closely connected to career progression. Furthermore, travel decision-making, even by those academics engaged in sustainability research, is commonly influenced more by ambition than by environmental awareness (Grémillet, 2008). Geographic mobility is often perceived to be closely related to academic excellence and career advancement (Leung, 2013) and evidence of the relationship between mobility and career progression is strengthening (Ackers, 2008):

The expectation of mobility is becoming deeply entrenched in recruitment and progression systems. In fact, the practice of mobility is so deeply embedded in academic career structures that it has become an expectation. So much so, that mobility, or a lack of academic travel, could negatively impact an academic’s career. Failing to demonstrate an international mobility experience is likely to be detrimental to career progression. (Ackers, 2008, p. 419)

While there have been calls for scientists “to ask themselves if their meeting or conference is really necessary” (Nature Editorial, 2008), academic travel can also be driven by the perceived negative consequences of reduced or restricted travel. In order to succeed in their position, academic staff members might be compelled to take up networking and career progression opportunities, particular for early and mid-career academics. Those who resist global mobility may be at a career disadvantage (Lassen, 2009). This can, therefore, reinforce the perception that high academic mobility is an absolute necessity for aspiring scholars.

Narratives of university internationalisation demanding that academic staff and students engage in mobility practices emerged in the 1990s and have grown in prevalence (Storme et al., 2013). Many leading institutions now have divisions committed to the promotion and support of internationalisation (including activities such as international student recruitment, student exchanges, development of institutional partnerships and international visitors). The Organisation for Economic Co-operation and Development (OECD) states that globalisation and “internationalisation” are dynamically linked concepts (OECD, 1999). In a university context, internationalisation is understood to involve an ethos of “creating a culture or climate on campus which promotes and supports international/intercultural initiatives” and a process of “integration or infusion of an international or intercultural dimension into teaching, research and service through a combination of a wide range of activities, policies and procedures” (OECD, 1999, p. 15). These guidelines explicitly call for the physical mobility of academic staff members and students with the goal of increased internationalisation.

Alongside the drive for internationalisation, long-haul, international business travel has substantially increased (Høyer & Naess, 2001; Leung, 2013). There are calls for much of this travel to be replaced with virtual meetings (Fox et al., 2009) and research has shown that videoconferencing could reduce Scope 3 transport carbon emissions by up to 44% (Achten et al., 2013). Yet while there are increasing opportunities to substitute travel with virtual connections, within the business environment, Hall (2009) argues that globalisation “determines a set of practices that reinforce the internationalisation of business management and arguably make it even more difficult to replace direct face-to-face contact with virtual contact” (p. 15). Face-to-face meetings provide valuable space for thinking, developing ideas and networking, with online communications perceived to be more useful for continuing established relationships (Nature Editorial, 2008). Consequently, despite
advancements in information communication technologies (ICT), physical mobility demands can be enforced by the internationalised academic environment.

It is therefore evident that tertiary institutions, and particularly those in physically distant locations like New Zealand, face a serious problem related to the wicked problem of climate change and academic mobility, which needs to be addressed.

**Methods**

The empirical material presented in this paper arises from a comparative analysis of policy documents from three top-ranking New Zealand universities: the University of Otago (Otago, hereafter), the University of Auckland (Auckland, hereafter) and Victoria University of Wellington (Victoria, hereafter). This research investigates the institutional drivers of academic mobility in an era of climate change. In doing so, it responds to three questions:

- To what extent, and in what ways, do New Zealand tertiary institution policies promote academic mobilities?
- How is sustainability integrated into university policy?
- What is the role of internationalisation in university policy, and how might this promote academic travel?

**Context**

New Zealand is situated in the South Pacific with a domestic population of c.4.5 million people (Statistics New Zealand, 2014), and land area similar to the United Kingdom (UK). However, it is a highly urbanised country, with 86% of the population living in urban regions (United Nations Department of Economic & Social Affairs, 2014). There are relatively large distances between the main urban centres, which are connected mainly by aviation, with very low levels of intra- and intercity train transport and a slow intercity bus network. New Zealand’s transport system is dominated by private cars, with low levels of investment in public and active transport modes. Internationally, New Zealand’s closest neighbours are eastern seaboard Australia and Fiji. Beyond these destinations, all flights from New Zealand are categorised as “long-haul” (3300—17,000+ km) under the UK’s Department for Environment, Food and Rural Affairs (DEFRA) approach (DEFRA, 2009; Smith & Rodger, 2009).

The University of Otago is situated in Dunedin on the South Island of New Zealand. As such it is one of New Zealand’s, and possibly the world’s, most isolated universities. Otago relies heavily on non-local domestic student catchments and international student markets, with over 75% of students coming from outside the province of Otago. Auckland is New Zealand’s largest urban area and situated on the upper North Island. Its student body consists of 12% international students. Victoria is situated in New Zealand’s capital city, Wellington, on the lower North Island and has approximately 17% international students. For academic staff in New Zealand, engaging with the wider academic communities both nationally and internationally is almost entirely dependent on air travel. Due to this geographic context and the imperative to address aeromobilities, there is a pressing need to investigate academic travel. University policy represents a starting point at which to establish and interpret the institutional position.

Otago, Auckland and Victoria are the top three New Zealand universities in the 2012 Performance Based Research Funding (PBRF) assessment. All three are in the top 300 universities of both the QS World University Rankings and the Times Higher Education World University Rankings (see Table 1). The three universities were selected for this
Table 1. Features of the three New Zealand universities employed in the policy analysis.

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>University of Auckland</td>
<td>40,784</td>
<td>175</td>
<td>92</td>
<td>2</td>
</tr>
<tr>
<td>Victoria University of Wellington</td>
<td>16,787</td>
<td>276–300</td>
<td>275</td>
<td>1</td>
</tr>
<tr>
<td>University of Otago</td>
<td>21,416</td>
<td>251–275</td>
<td>159</td>
<td>3</td>
</tr>
</tbody>
</table>

study due to their domestic and international standings, and engagement in climate change and/ or sustainability research through research centres including the Centre for Sustainability (Otago), the Otago Climate Change Network (Otago), Centre for Environmental Law (Auckland) and New Zealand Climate Change Research Institute (Victoria). Victoria, in particular, has established itself as a “sustainable university”; it is the only New Zealand university signatory of the Talloires Declaration, it appointed New Zealand’s first assistant vice chancellor (sustainability), and it has announced intentions to “review its investment in carbon-emitting fossil fuels” (Victoria University of Wellington, 2014) therefore leading the way for New Zealand academic institutions in terms of divestment.

The mission statements of all three universities explicitly highlight commitment to international communities and developing international links (Table 2).

Across the three institutions, the extent of academic travel will vary according to the number of academic staff members, as well as the norms relating to travel and financial support. However, a report from Victoria University provides some indication of the scale

Table 2. The mission statements of Otago, Auckland and Victoria universities.

<table>
<thead>
<tr>
<th>University</th>
<th>Mission statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Auckland</td>
<td>“A research-led, international university, recognized for excellence in teaching,</td>
</tr>
<tr>
<td></td>
<td>learning, research, creative work, and administration, for the significance of its</td>
</tr>
<tr>
<td></td>
<td>contributions to the advancement of knowledge and its commitment to serve its</td>
</tr>
<tr>
<td></td>
<td>local, national and international communities”.</td>
</tr>
<tr>
<td>Victoria University of Wellington</td>
<td>“Victoria University of Wellington plays a leading role in shaping New Zealand’s</td>
</tr>
<tr>
<td></td>
<td>future by: adding significantly to the knowledge and understanding of natural</td>
</tr>
<tr>
<td></td>
<td>phenomena, society, culture and technology through research, teaching and</td>
</tr>
<tr>
<td></td>
<td>interdisciplinary perspectives; engaging with local, national and international</td>
</tr>
<tr>
<td></td>
<td>communities in creating, disseminating and applying knowledge that has scholarly</td>
</tr>
<tr>
<td></td>
<td>or societal impact; developing graduates with skills in leadership, communication</td>
</tr>
<tr>
<td></td>
<td>and critical and creative thinking”.</td>
</tr>
<tr>
<td>University of Otago</td>
<td>“The University of Otago will create, advance, preserve, promote and apply</td>
</tr>
<tr>
<td></td>
<td>knowledge, critical thinking and intellectual independence to enhance the</td>
</tr>
<tr>
<td></td>
<td>understanding, development and well-being of individuals, society and the</td>
</tr>
<tr>
<td></td>
<td>environment. It will achieve these goals by building on foundations of broad</td>
</tr>
<tr>
<td></td>
<td>research and teaching capabilities, unique campus learning environments, its</td>
</tr>
<tr>
<td></td>
<td>nationwide presence and mana¹, and international links”.</td>
</tr>
</tbody>
</table>

¹Mana is a Māori word meaning a supernatural force which can be embodied in a person, place or object. Mana refers to: prestige, authority, power, influence, status, spiritual power and/or charisma (Maori Dictionary, 2015).
of travel from these institutions. From 2007 to 2008, academic kilometres travelled at Victoria increased by 9%, to 35 million kilometres. This travel cost the university $4.6 million and produced 3830 tonnes of carbon emissions, accounting for 12% of Victoria’s total emissions (Victoria University of Wellington, 2009). The three institutions each have approximately 1500—2000 full-time equivalent academic staff members, all of whom are likely to be attending conferences annually. An indication of the distances required and carbon emitted to key destinations from New Zealand is presented in Table 3.

**Research methods**

Content analysis was chosen as the most suitable way to draw interpretations from university policy. A qualitative, interpretivist approach to content analysis was employed as it allows for comparisons to be undertaken between different documents and perspectives (Druckman, 2005; Krippendorff, 2013). Otago, Auckland and Victoria policies were accessed through an online database search on each university website. Following identification of all university policies, each was independently assessed by three team members for relevance to this research. A coding system was employed to identify policy relevance to academic transport and travel. This process identified 14 policies for Otago, 14 policies for Victoria and 17 policies for Auckland (Supplemental Data 1, available in the web-based version of this paper). While there is a variety of approaches to conducting content analysis, ranging from mechanical word counts to interpretations of themes (Druckman, 2005), for the purpose of this research these policies were thematically coded by one researcher.

A modified Graneheim and Lundman (2004) system of coding was used. The policies were read multiple times to obtain a sense of the whole policy before relevant data were extracted and brought together in one document to constitute the unit of analysis. This document was then condensed and categorised into codes and sub-codes (Graneheim & Lundman, 2004). The coded data were subject to three blinded interpretations and moderated by a fourth researcher to reduce individual interpretation bias (Burnard, 1991) and to identify consistency and contestations within the interpretations. Emergent overriding themes were then identified. One researcher overviewed the results from each university, removed repetition and sought out similarities in the themes between the universities (Tables 3–5, and Supplemental Data 2, available in the web-based version of this paper).

Table 3. A table of the distance and carbon related to air travel from New Zealand to key global destinations.

<table>
<thead>
<tr>
<th>Journey (from Christchurch)</th>
<th>Distance (km, return journey)</th>
<th>Carbon emitted¹ (tonnes of CO₂-e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney, Australia</td>
<td>4642</td>
<td>0.45</td>
</tr>
<tr>
<td>London, England</td>
<td>41,420</td>
<td>3.62</td>
</tr>
<tr>
<td>Shanghai, China</td>
<td>21,318</td>
<td>1.86</td>
</tr>
<tr>
<td>Vancouver, Canada</td>
<td>26,292</td>
<td>2.30</td>
</tr>
<tr>
<td>New York, USA</td>
<td>32,030</td>
<td>2.80</td>
</tr>
<tr>
<td>Sao Paulo, Brazil</td>
<td>25,199</td>
<td>2.20</td>
</tr>
</tbody>
</table>


¹Per passenger.
Table 4. Examples of policy codes and sub-codes from the University of Otago.

<table>
<thead>
<tr>
<th>Code</th>
<th>Sub-code</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restrictions on travel</td>
<td>Purpose</td>
<td>“Staff seeking Conference Leave will normally be expected to be taking an active part in the conference or meeting concerned, such as presenting a paper or poster, chairing a session or other designated function relating to the conference or the sponsoring organization” (conference leave policy p1)</td>
</tr>
<tr>
<td></td>
<td>Timing of leave</td>
<td>“Staff members are expected to organize their RSL so that it will start and/or finish at a break in the academic year unless there are strong reasons why this should not be so” (p. 7)</td>
</tr>
<tr>
<td></td>
<td>University</td>
<td>“A prolonged stay based at one centre is preferred to shorter visits to a number of different centres” (p. 11)</td>
</tr>
<tr>
<td></td>
<td>preferences</td>
<td>Modal choice</td>
</tr>
<tr>
<td></td>
<td>International-</td>
<td>Promotion</td>
</tr>
<tr>
<td></td>
<td>isation</td>
<td>“Referees (for promotion) must include: one referee from New Zealand, but not from within your own department; one further Australasian referee; must include at least three international referees (of which no more than two may be from the same University)” (Academic Promotions Policy p. 22, 36)</td>
</tr>
<tr>
<td></td>
<td>Engagement with</td>
<td>“Engage internationally on matters of global betterment” (University Strategic Direction Policy p. 8)</td>
</tr>
<tr>
<td></td>
<td>global issues</td>
<td>Contributing to international-</td>
</tr>
<tr>
<td></td>
<td>Supporting</td>
<td>academic travel</td>
</tr>
<tr>
<td></td>
<td>External</td>
<td>collaborations</td>
</tr>
<tr>
<td></td>
<td>Funding</td>
<td>“Service to external academic and/or professional activities that contribute to the research environment” (Academic Promotions Policy p. 54)</td>
</tr>
<tr>
<td></td>
<td>travel</td>
<td>“University funds may be used to support the attendance of staff or students at conferences or meetings, where it is deemed that such attendance would advance the objectives of the University” (Conference Leave Policy p. 2)</td>
</tr>
<tr>
<td>Processes and procedure</td>
<td>Approval</td>
<td>“Staff members must obtain prior written approval for all international travel from their Head of Department (in the case of Academic Divisions) or their Pro-Vice-Chancellor or Divisional Head” (Travel and Travel Related Costs Policy p. 1)</td>
</tr>
<tr>
<td></td>
<td>Travel club</td>
<td>membership</td>
</tr>
<tr>
<td></td>
<td>Cost efficiency</td>
<td>of travel</td>
</tr>
<tr>
<td></td>
<td>(continued)</td>
<td></td>
</tr>
</tbody>
</table>
Table 4. (Continued)

<table>
<thead>
<tr>
<th>Code</th>
<th>Sub-code</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability</td>
<td>Sustainability</td>
<td>“Sustainability will become embedded as a principle against which all aspects of campus development and operations are considered, and we will seek to develop national leadership and be genuinely world class in this area” (University Strategic Direction Policy p. 7)</td>
</tr>
</tbody>
</table>

Table 5. Examples of policy code and sub-code from the University of Auckland.

<table>
<thead>
<tr>
<th>Code</th>
<th>Sub-code</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restrictions on travel</td>
<td>Justification</td>
<td>“The approving manager must be satisfied that the travel and associated costs are necessary for university purposes, consistent with university policy and are within budgetary limits” (Travel Entertainment and Expenses Policy p. 3)</td>
</tr>
<tr>
<td></td>
<td>Cost effectiveness</td>
<td>“In the interests of cost-effectiveness, consideration should be given to the following when arranging air travel: 1) travel at off peak times; 2) The use of discounted fares such as Smart Saver fares for outbound Travel, and retaining maximum flexibility on return travel” (Travel Entertainment and Expenses Policy p. 3)</td>
</tr>
<tr>
<td>Supporting academic travel</td>
<td>Value</td>
<td>“Annual Leave is important for both the health and wellbeing of the staff member and the financial health of the university, and must be managed to these ends” (Annual Leave Policy p. 1)</td>
</tr>
<tr>
<td></td>
<td>Travel club membership</td>
<td>“… SMT members may approve airline flight club membership for frequent travellers (20 or more trips a year)” (Travel Entertainment and Expenses Policy p. 8)</td>
</tr>
<tr>
<td>Internationalisation</td>
<td>Promotion</td>
<td>“… Invitations to lecture at international and/or national conferences; major contributor to, and leader and originator of, research projects…” (Academic Grades Standards and Criteria p. 5)</td>
</tr>
<tr>
<td>Strategic direction</td>
<td></td>
<td>“Strengthen institutional relationships and partnerships with selected leading international universities from whom we can learn and to whom we can contribute” (Auckland University Strategic Plan 2013–2020 p. 21)</td>
</tr>
<tr>
<td>Processes and procedure</td>
<td>Cost effectiveness</td>
<td>“It is expected that outside cities, travel by air or train will generally be more cost-effective having regards to travel times” (Travel Entertainment and Expenses Policy p. 7)</td>
</tr>
<tr>
<td>Sustainability</td>
<td>Research</td>
<td>“Conduct research in an environmentally sensitive manner, and taking account of its wider environmental implications” (Environmental Policy p. 2)</td>
</tr>
<tr>
<td></td>
<td>Commitment</td>
<td>“Our policies and practices must support the sustainability of the university both in a financial sense, through effective resource utilization, and in creating an environment that our communities can enjoy and be proud of” (Auckland University Strategic Plan 2013–2020 p. 17)</td>
</tr>
</tbody>
</table>
Results

Tables 4, 5 and 6 present examples of the findings which emerged from thematic coding of policy documents from Otago \((n = 14)\), Auckland \((n = 17)\) and Victoria \((n = 14)\), respectively.\(^4\) The main codes arising from the content analysis were: restrictions on travel, internationalisation, supporting academic travel, processes and procedures, sustainability and expectations. These were then further developed by a number of sub-codes. Full tables of coding are presented in Supplemental Data 2. A brief overview of the results for each academic institution, will now be presented.

University of Otago

The University of Otago describes itself as an “international university” in its mission statement (Table 2), and acknowledges a commitment to serve local, national and international communities. This internationalisation imperative dominates Otago’s policies. Promotion of academic engagement with international research communities was evidenced through promotion requirements, and international linkages. Moreover, more so than the

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>Restrictions on travel</td>
<td>Justification</td>
<td>“The approving manager will satisfy him/herself that the proposed travel and the associated costs are necessary, reasonable, for University purposes …” (Travel and Expenses Policy p. 3)</td>
</tr>
<tr>
<td>Supporting academic travel</td>
<td>Collaborations</td>
<td>“Victoria University of Wellington (‘the University’) seeks to increase its external research and consultancy income and engage more actively with industry …” (Management of External Research, Consultancy and Related Contracts Policy p. 1)</td>
</tr>
<tr>
<td>Expectations</td>
<td>Benefit to university</td>
<td>“The general principle governing the allocation of all research funding in the University is that it is an investment intended to maximize the range of outcomes that the University expects to result from staff and student research” (Research Policy p. 3)</td>
</tr>
<tr>
<td></td>
<td>Rewards</td>
<td>“Where frequent flyer reward points or other similar benefits are gained in the course of University travel, staff are encouraged to utilize these reward points to facilitate future University Travel” (Travel and Expenses Policy p. 4)</td>
</tr>
<tr>
<td>Sustainability</td>
<td>Impacts</td>
<td>“The Environmental Policy had been produced as part of the growing awareness of human effects on the biosphere” (Environmental Policy p. 2)</td>
</tr>
<tr>
<td></td>
<td>Commitments</td>
<td>“Victoria University recognizes its responsibilities to manage the nature and scale of environmental impacts of its activities, products or service … 2) A commitment to implementing sustainable and environmentally sound business practices to manage and reduce the university’s environmental footprint, … 5) A commitment to support the research and teaching of environmental sustainability” (Environmental Policy p. 2)</td>
</tr>
<tr>
<td></td>
<td>Transport</td>
<td>“Encourage the use of environmentally responsible transportation modes such as public transport, clean fuel vehicles, cycling or walking” (Environmental Policy p. 3)</td>
</tr>
</tbody>
</table>
comparative institutions, Otago promoted the geographic origins of its student body, again indicating the importance of internationalisation.

Transport mode (e.g. car, train, plane), duration (e.g. long stay versus short stay) and timing (e.g. not coinciding with teaching commitments) were all prescribed through policy, largely relating to economic incentives and academic responsibilities (e.g. teaching). There was no evidence of this being related to sustainability objectives or motivations. Furthermore, the treatment of travel as a reward for academic merit emerged from some policies, with approval for travel required in most instances.

The issue of sustainability arose through the Strategic Vision, where it was stated that: “Sustainability will become embedded as a principle against which all aspects of campus development and operations are considered and we will seek to develop national leadership and be genuinely world class in this area”. Nevertheless, this does not as yet appear to be integrated to other policy, nor related to academic travel. Unlike Auckland and Victoria, Otago does not have a discrete Environmental Policy.

**University of Auckland**

The analysis of University of Auckland policy indicated an economic imperative around transport and travel. In particular, the Travel and Travel Related Costs Policy highlighted a range of factors which should be considered with regards to travel and accommodation expenditure; “purpose, distance, time, urgency, personal health, security and safety considerations” (Travel and Travel Related Costs Policy p. 1), and suggests an economic, rather than sustainability, focus for travel decision-making.

Institutional relationships with international universities were highlighted through the university Strategic Plan, which also spoke directly to the importance placed on collaborations and relationship building for academic staff members. Auckland policy spoke of “contributing to the international academic community” and this could imply incentives to highly mobile academics, and processes which encourage travel. Therefore internationalisation appeared to be a strong driver of academic mobility for Auckland.

Auckland has a Sustainability Policy which states that the university will: “Conduct research in an environmentally sensitive manner and taking account of its wider environmental implications” (Environmental Policy p. 2). Yet while sustainability is an objective, this relates to waste reduction, and resources used on campus rather than transport and travel. Furthermore, the sustainability policy did not intersect or relate to other policies and therefore sat in isolation.

**Victoria University of Wellington**

From the analysis of three New Zealand institutions, Victoria University of Wellington provided the only sustainability policy that explicitly referred to travel. The Sustainability Policy speaks to travel decision-making, and states that the university will: “Encourage the use of environmentally responsible transportation modes such as public transport, clean fuel vehicles, cycling or walking”, but does not go so far as to discuss the need for, or imperative to travel, nor associate it with international transport modes. Therefore, while Victoria has acknowledged the need to consider transport modes, it appears to mirror Auckland and Otago in demonstrating institutional expectations around academic travel and mobilities. This is confirmed by text within Victoria’s Travel Insurance Procedure (p. 2), which clearly states that: “International travel is a vital component of conducting the business of the University”.

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While justification for academic business travel is required and clearly articulated through policy, it appears to arise from a financial, rather than environmental, perspective; “The approving manager will satisfy him/herself that the proposed travel and the associated costs are necessary, reasonable, for University purposes, are consistent with University Policy and covered by the available budget or grant prior to granting approval” (Travel and Expenses Policy p. 3). Thus the monitoring of proposed travel appears to be intrinsically connected to budgeting and cost-effective travel rather than environmental sustainability.

Discussion
This paper presents a content analysis of university policy at three academic institutions in New Zealand, exploring institutional drivers of academic mobility. It specifically relates to three research questions investigating the extent to which institution policies promote academic travel, if and how sustainability is integrated into university policy, and how internationalisation might thus promote academic travel.

The analysis indicated some broad consistencies across the three Universities in terms of types of policies and dominant narratives. It also highlighted a lack of engagement with “Scope 3” transport-related emissions, and policies necessitating international connections and overseas travel. While both Victoria and Auckland have existing sustainability policies, only Victoria has text specifically related to transport and mobility. This policy encouraged “the use of environmentally responsible transport modes” where possible, but provided no guidance on the frequency of, or necessity for travel. The University of Otago appears to promote internationalisation, and offers little coherence between its strategic directions and individual policies. Three interrelated themes emerged from our analysis, which we titled “hollow words”, “unspoken words” and “facilitating mobilities”.

Hollow words
The theme hollow words describes a lack of meaningful commitment to sustainability, evidenced by disconnections between sustainability rhetoric and key university policies as well as between and within policies. All three Institutions, to varying degrees, acknowledged sustainability and articulated the need to embed sustainability across University endeavours. Both Victoria and Auckland have Sustainability Policies that recognise “the need to address the wider environmental issues facing society” (Victoria Environmental Policy) and state that educational institutions “have a pivotal role in the promotion of environmental sustainable management” (Auckland Environmental Policy). At Otago, the Strategic Vision includes a sustainability imperative which states that “sustainability will become embedded as a principle against which all aspects of campus development and operations are considered and we will seek to develop national leadership and be genuinely world class in this area” (Otago Strategic Vision). Yet Otago still lacks a specific policy related to environmental sustainability. Moreover, in line with previous research, sustainability appears to relate more specifically to campus-based operations (Scopes 1 and 2), rather than transport or travel (Scope 3).

The focus on campus sustainability was also apparent at Auckland, where the Strategic Plan noted that “sustainable practices to make more efficient use of resources and enhance our environmental performance”. However, in this context, sustainability appears to be focused on waste reduction and resource consumption rather than the behaviours of academic staff members, or transport and travel. This is particularly telling
when considered alongside additional objectives from the Strategic Plan with actions on strengthening relationships and partnerships with selected leading international universities and promoting collaborative arrangements.

Internationalisation imperatives appear to override any sustainability objectives. This is personalised for academic staff through confirmation, conference leave and research and study leave policies, all of which require evidence of international standing and collaborations which can incentivise travel. For example, Otago’s Academic Promotions Policy stated that academics should provide evidence of their “Contribution to the University’s internationalisation goals, e.g. recruitment, support and effective teaching of international students” (Academic Promotion Policy). This could suggest that, as highlighted in a 2008 editorial in *Nature*, attendance at international conferences could be the result of academics seeking to develop their CVs, rather than “a desire for real intellectual exchange” (*Nature* Editorial, 2008, p. 836).

Internationalisation has been an imperative for academic institutions for over 25 years (OECD, 1999), but this concept will mean different things within and between countries. For example, internationalisation can have quite different material consequences (e.g. behavioural responses and associated CO₂ emissions) for New Zealand institutions, than for those based in continental Europe, where access to international collaborations may be possible without air travel. What therefore became clear through this theme was that internationalisation and sustainability were often mutually exclusive and this highlighted disconnect within and across policies at each institution. While policies on and about sustainability were visible at each university, there seemed little integration of the sustainable rhetoric within wider policies. Hence, whether purposeful or not, engagement with the ethics of academic mobility became increasingly obvious.

There was no evidence through this analysis of existing university-wide policy supporting carbon offsetting. Offsetting may occur at a departmental level; however, it appears to be linked to individual behaviour as opposed to being normative practice. For example, in the Victoria University Sustainability Guide, despite acknowledging the contribution of overseas travel to the university’s carbon emissions, it is stated that, “the University does not currently offset travel, but you could personally offset your own trips” (Victoria University of Wellington, 2009, p. 9). This suggests that Victoria University perceives the mitigation of work-related travel to be the responsibility of individual employees rather than the institution.

**Unspoken words**

The second theme, *unspoken words*, arises from assumptions about the necessity of travel, and the non-existence of travel-substitution policies or regulations which could provide a sustainable alternative in some contexts. In addition, the “unspoken words” theme relates to limited discussion of sustainability throughout the policy settings for all three universities.

This theme was reflected in the assumptive language used in many policies at all three universities. Across the three institutions, there were assertions that travel was a key part of university business, in particular in terms of research and internationalisation. For example, at Victoria this was clearly articulated: “International travel is a vital component of conducting the business of the University”. It could therefore be anticipated that academic travel behaviour will reflect these norms. Especially for academics concerned with confirmation, progression and promotion.

For an academic career, the necessity of travel and international engagement for career progression and promotion was implicit within the analysed policies. While
opportunities exist to promote travel substitution through ICT and virtual meetings or symposium, conference or webinar attendance, the process of globalisation can reinforce norms and practices which demand international mobility (Hall, 2009). Moreover, there was no evidence from this research of university policy related to travel substitution or alternative engagement, at any of the three institutions. Thus while videoconferencing facilities are available across the institutions, it does not appear to be widely employed as a travel substitution option. Academic staff members for whom travel might be unfeasible (e.g. for work or home commitments) appear to have few alternatives to physical mobility, with potentially negative impacts for career development. This could perpetuate well-established gender inequalities in academic careers (Bailyn, 2003), and is incongruent with perceptions of academic careers as flexible and adaptable to family commitments, something the policy analysis identified. This flexibility is exemplified by the inclusion of family-related costs during research and study leave: “Costs related to family travel for one month or more are considered an acceptable business expense …” (Otago, Research and Study Leave Policy Amendments p. 3).

Reference to transport through university policy appears to relate to financial expenditure and institutional commitments. Across the institutional policy settings, academic staff members were asked to reflect upon modal choice, duration of travel and necessity for travel, but these considerations were never explicitly related to environmental sustainability; rather they appeared to be focused on financial expenditure and value for money. This is despite statements in environmental policy (Auckland and Victoria) and Strategic Directions (Otago) claiming sustainability considerations.

An example of unspoken words arises from Otago’s recommendation for “prolonged stay based at one centre rather than shorter visits to a number of different centres” (Research and Study Leave Policy). While this advice could benefit environmental imperatives through reduced travel, this was not explicitly stated as a goal of the policy. Therefore, it is difficult to assess the degree to which environmental sustainability is integrated through university policy.

**Facilitating mobilities**

The third theme relates to how university policies can facilitate mobilities. This is defined as promoting travel, providing benefits for those who travel, and the blurring of leisure and business travel which could work to encourage superfluous travel, but might also reduce the total number of trips.

For various reasons, New Zealand’s academic institutions may encourage, or facilitate the mobility practices of academic staff members. This facilitation was evident through the analysis of university policy not only through connectedness of travel and career promotion, but also through more tangible benefits including airline club membership. At the University of Otago, it is stated that: “Membership of Air New Zealand Koru Club will be paid by the University where it can be demonstrated that a staff member spends considerable time travelling on Air New Zealand either domestically and/or internationally, as part of their required University duties” (Travel Clubs Membership Policy). Likewise, Auckland supports travel club membership for frequent travellers, defined as over 20 trips per year. While the provision of membership may produce increased productivity for travelling staff members (e.g. quieter work spaces, Internet access), it could also incentivise superfluous travel for those seeking to gain membership. It could also signal an elite group of staff members who may be perceived to be successful and highly mobile, thus inferring a status upon those who engage in high mobility (Gössling & Nilsson, 2010).
The blending of business and leisure travel was evident through university policy at all three institutions, “Staff members may undertake private travel before, during, or at the end of travel paid for by the University …” (Travel and Travel Related Cost Policy, University of Otago). It was also evident that family members were facilitated to accompany staff members on university business travel, where additional leisure travel was combined. This is connected to work—life flexibility which is evident in other aspects of an academic career. It would facilitate both increased and decreased overall mobility. For example, combining business travel with annual leave could result in unnecessary academic travel to conferences in desirable locations (Høyer, 2009); this is particularly relevant where funding for conference travel expires annually therefore incentivising annual conference travel. However it could also result in decreased flights if individual staff members use conference travel for annual holidays, especially from New Zealand where extreme long-haul travel is required for most destinations (Smith & Rodger, 2009). Therefore a substantial saving in individual carbon emissions could be generated by combining business and leisure travel if it results in reduced overseas travel.

In sum, this research indicates that despite rhetorical commitment to sustainability, which is increasingly evident in academic institutions, sustainability is not addressed at all in the key travel-related policies at the three New Zealand institutions.

Conclusions and implications: the future of academic travel

The content analysis of university policy presented in this paper provides evidence of low levels of engagement with environmental sustainability across the three New Zealand academic institutions. Academic travel appears to be embedded in policy as an aspiration or expectation of an academic staff member’s career. This is evidenced through international partnerships/collaboration and presentation of research findings at international conferences being key indicators of academic performance, and part of the recruitment and promotion processes. This research identifies a need to consider the spatial implications of internationalisation imperatives for higher education institutions. The way internationalisation is interpreted and performed by academic institutions will differ substantially, but where it is connected with academic mobility, there will be high ecological costs associated with this international priority.

Academic institutions need to acknowledge and account for their carbon emissions, ensuring this includes all work-related Scope 3 travel and transport emissions. This could include a sector-wide approach similar to that used by the HEFCE. However, it is critical that Scope 3 emissions are included in any carbon accounting processes and emission reduction targets. Moreover, since the targets set in England are not being achieved, in New Zealand an alternative approach might include targets being tied to funding (e.g. PBRF), or involve legally binding targets. Nevertheless, this research identifies a pressing need for New Zealand’s academic institutions to engage with their transport- and travel-related carbon emissions, and to directly and explicitly connect sustainability objectives with broader policy goals.

The merging of business and leisure appears to be facilitated by university policy, and this requires further exploration. On the one hand, it could reduce the number of trips, by combining conference attendance, for example, with holidays. However, it is more likely to simply incentivise travel (business and leisure) and perhaps lead to unnecessary academic mobility through the practice of poorly justified conference attendance. Further research, engaging with academic staff members, is required to better understand how the business—leisure continuum is interpreted and how it manifests in academic mobility patterns.
The physical remoteness of New Zealand institutions is a key feature of discourses on academic mobilities, and could be a frame through which academic mobility is justified and prioritised. In particular, this absolute notion of space is used to justify the necessity to engage in long-haul mobilities in order to meet with collaborators and colleagues. Yet a more creative and reflexive understanding of space and distance can highlight ways through which relationships can be established and maintained without physically traversing space, but through the use of Internet-based technologies.

Travel avoidance was highlighted by the IPCC as a key way to reduce direct GHG emissions from transport (Sims et al., 2014). Institutional investment in ICT may offer viable alternatives for some types of academic travel, but this requires investment and encouragement, which must be fostered through the institutional policy context. Radical emissions mitigation certainly demands careful examination of the justification of academic mobility practices, which should in turn be reflected in revised institutional policies relating to travel. It also requires alternatives to travel (travel substitution) to be explored and acted upon.

If academic institutions wish to fully engage with environmental sustainability imperatives and withstand close scrutiny in terms of “global citizenship”, it is critical that they address responsibilities for academic travel and related carbon emissions which contribute to the wicked problem of climate change. Sustainability needs to be systematically integrated into all key policies, including, but not limited to, those analysed in this research. Not only do academic staff need to reflect upon the need to travel, but they need to do so in the context of a supportive academic environment. As the sustainability claims of universities become subject to increasing scrutiny amongst prospective students and other key stakeholders, the pressing issue of bringing academic mobility onto a sustainable emissions path will become ever more urgent.

Acknowledgements

The authors acknowledge the support of an Otago Business School summer scholarship (2013/14) for this research and would like to thank Hilary Phipps, three anonymous reviewers, and the editors and guest editors, for feedback on an earlier version of this paper.

Disclosure statement

No potential conflict of interest was reported by the authors.

Supplemental data

Supplemental data for this article can be accessed here.

Notes

1. 17% Dunedin, 11% Otago/Southland, 18% rest of South Island, 39% North Island, 14% overseas. http://www.otago.ac.nz/about/quickstats.html#8.
2. Neither Auckland nor Victoria provides a breakdown of domestic student’s home regions. But with larger local populations, they are likely to attract more local students.
3. Equivalent to Australia’s Excellence in Research for Australia assessment and similar to the UK’s Research Excellence Framework assessment.
4. The full tables with examples are available in Supplemental Data 2.
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